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AN ANALYSIS OF SOURCES AND PROCESSES OF INNOVATION IN EDUCATION.

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A DISCUSSION WAS PRESENTED ON EXISTING AND POTENTIAL SOURCES OF EDUCATIONAL INNOVATION, THE CONDITIONS UNDER WHICH INNOVATION OCCURS, AND THE CHANGES WHICH MUST BE MADE TO TIE TOGETHER KNOWLEDGE AND PRACTICE. CERTAIN PROBLEMS OF DISTINCTION AND DEFINITION WERE NOTED. CURRENT SOURCES OF EDUCATIONAL INNOVATION DISCUSSED INCLUDED (1) CLASSROOM TEACHERS, (2) SCHOOL ADMINISTRATORS, (3) SCHOOL BOARDS, (4) THE LAY PUBLIC, (5) STATE DEPARTMENTS OF EDUCATION, (6) EDUCATION FACULTIES OF COLLEGES AND UNIVERSITIES, (7) PROFESSIONAL ASSOCIATIONS, (8) THE U.S. OFFICE OF EDUCATION AND OTHER FEDERAL AGENCIES, (9) TEXTBOOK PUBLISHERS, AND (10) SCIENTISTS, TECHNICAL SPECIALISTS, AND OTHER EXPERTS. CONDITIONS FOSTERING AND DISCOURAGING INNOVATION WERE PRESENTED BY GENERALIZATIONS FROM THE STUDY OF CHANGE AT SOCIETAL LEVELS. THE PREVAILING CONDITIONS IN EDUCATIONAL SETTINGS AND IDEAS FOR TRANSLATING KNOWLEDGE INTO PRACTICE WERE ALSO DISCUSSED. (RS)

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AN ANALYSIS OF SOURCES AND PROCESSES OF INNOVATION IN EDUCATION

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The present widespread interest in the study of planned change, while unparalleled in the history of education, is fully justified. We have learned the hard way that education is intimately bound to the social trends and rapid changes that characterize our society. Whether or not education must adapt to changing social conditions is not a debatable point; the alternative to planned change is to be buffeted about by the pressures and demands of a society that clamors for educational services of many kinds. Planned change permits not only a means of coping with these demands, but makes it possible for the field of education to participate in shaping the trends and changes themselves rather than merely responding to them.

During the past three years several conferences similar to this one have brought colleagues from a number of disciplines together to examine the state of knowledge regarding social change, innovation, adoption, and diffusion. In each case the purpose has been to discuss the implications of these matters for educational research and practice. While much has been learned as a result of these conferences, we have by no means exhausted the pertinent dimensions of change, nor have we discussed fully and systematically the implications of what is known about innovation for the field of education. The topic of this paper—

the sources of educational innovations--is a case in point. To my knowledge, the specific subject has not been treated in detail in previous discussions, although the literature I have surveyed contains material relevant to the topic. Of greater significance is the fact that looking at sources of innovations provides us with a very appropriate perspective from which we can examine the entire process of change in education. In this paper, I shall deal with existing and potential sources of innovation; the conditions under which innovations can occur; and the changes that must be made in order to tie together knowledge and practice.

SOME DISTINCTIONS AND DEFINITIONS

At this point, it is well that we take note of certain problems of distinction and definition, looking first at some of the key terms that are of concern to us. To begin with, the term "innovation" is itself defined in different ways. In his well-known book on innovation, Barnett said "An innovation is here defined as any thought, behavior, or thing that is new because it is qualitatively different from existing forms" (2, p. 7). This definition emphasizes discovery, or the combination of existing elements into a new configuration or product. A different conception of innovation is used by Everett Rogers, who indicates that "innovators are the first members of the social system to adopt new ideas" (25, p. 55). In this definition the discoverer is not involved; the first "user" is the innovator. Both of these conceptions, of course, are appropriate in analyses of innovation.

It is important to observe that we have not traditionally distinguished with care between individuals or persons as sources of innovation and organizational sources, or between innovative or creative individuals and innovative or creative organizations (19, p. 12). In fact, our preoccupation with the role of the individual may have seriously delayed and hampered our search for insight into the innovative process.

Far from being homogeneous in origin, educational innovations have a multiplicity of sources. Not only do educational changes vary in origin in terms of such factors as type and level of organization, but they also differ in terms of the mental activity which gives them birth. As Miles has said, "A very wide variety of strategies for creating and controlling educational change is being employed--polemical, manipulative, technological, prestige-based, experimental, moralistic--with varying degrees of success" (17, p. 2). Furthermore, innovations may result from new discoveries arising out of research, or they may originate in rational analysis, deduction, speculation, dogmatic assertion, or other types of processes.

We have also confused the sources of innovation with its causes. There are many "causes" of innovations, both external and internal, which lead to educational innovations. For example, current struggles for power among nations, developments in the American labor force, and the tremendous complexity of educational goals can all be cited as "causes" of innovative responses in the field of education. While the

analysis of these "causes" is of merit in its own right, in this paper I shall focus my attention on the sources of innovation.

Innovation involves many persons, organizations, events, and "sources." It is a series of processes. Innovation depends not only upon discovery and adoption, but upon translation, implementation, experimentation, evaluation, diffusion, institutionalization, and other processes. Innovation occurs at many levels--international, national, regional, state, and local--and in each locus there are complex processes that accompany it and a variety of "sources" that stimulate it.

Let me conclude these introductory comments with one final point. We should recognize the fact that the term "innovation" does not represent the entire range of matters that are our proper concern of study. Rather, the term "change" denotes the wide variety of subjects that we must investigate if we are to understand the problems with which we are dealing. "Change" refers to the whole spectrum of processes from discovery to institutionalization. Innovation, on the other hand, deals with a more limited number of factors in the total change process. Other terms, such as adoption and diffusion, refer to even more restricted phenomena. While this paper deals primarily with innovation, I shall make certain remarks which extend into other areas of the total change process.

CURRENT SOURCES OF EDUCATIONAL INNOVATIONS

While keeping in mind the above distinctions, let us now ask where the sources of innovation lie in American education today. First,

we shall establish a conceptual perspective for looking at this question, and then we shall look at some current sources of innovations.

My conceptual perspective consists of a simplified version of role theory, a mode of behavioral science analysis which focuses on the positions and roles of actors in organizational settings. Role theory assumes that for every position or status in an organization or other group setting, there are accompanying role behaviors and normative expectations. The norms or rules indicate to incumbents of positions what behavior is appropriate for them and expected of them. Normative expectations may be formal or official, or they may be a product of the informal groups to which an individual belongs. Further implied in role theory is that certain kinds of behavior--for example, innovation--are expected of incumbents of certain kinds of positions, but not expected of others. Indeed, it is quite possible that the normative expectations associated with any particular positions may encourage stability of behavior rather than creativity or other kinds of innovative activities. Given the situation in which the incumbent of a position may find himself, it may be completely unrealistic and impractical--even absurd--to expect certain kinds of behavior from him.

This very brief summary of the perspectives provided by role theory points us in the direction of "sources" of educational innovations. What I shall do in the following pages is to examine the positions of certain individuals, groups, and organizations in order to identify their relationships to the sources of innovation. In

choosing subjects of discussion, I must restrict my attention to a few that play key roles or are often said to do so.

(1) The Classroom Teacher.

There is a great deal of myth and sentiment surrounding the teacher's role in innovation, with much being neither true nor realistic. There is a general role expectation that the teacher will be innovative, but there is little agreement or evidence as to how this innovativeness is expressed. It seems probable that normative expectations limit teachers mainly to their own classrooms when innovation is involved (16, p. 410). Role expectations permit the teacher to be involved in the selection of curriculum content to a limited extent, but in the main the teacher is expected to have autonomy primarily with regard to the mode of presentation of materials, the expectations being that she will present them in such a way that learning is facilitated and that a high level of interest among the students will be maintained.

There is, indeed, evidence to indicate that the teacher's job conception does not range far beyond the borders of the classroom. In a study which Robert Carson, Keith Goldhammer, and I are presently completing (8), we examined the roles of teachers in community affairs, with special emphasis on educational activities. The teachers were questioned concerning their roles in 16 facets of educational decision-making in the school and community. They were further asked about their opinions concerning what roles teachers should play in educational

decision-making, about the roles the teacher perceived that other teachers had actually played in decision-making, and the roles that the individual respondent had actually played in decision-making activities. It is very clear that the teacher participates almost exclusively in activities pertaining to her own classroom, mainly determining her own schedule and the methods of instruction she will use. Furthermore--and this may be surprising to some--the teacher believes that these are the only activities in which other teachers establish policy, and that these are the only ones in which teachers should establish policy. These findings are further supported by evidence from a larger study (23), of which the one I have just mentioned is a part.

Studies dealing directly with innovation at the classroom level find consistently that teachers are not major innovators. For example, "Teachers are not change-agents for innovations of major scope. Even when free to guide their own activities, teachers seldom suggest distinctly new types of working patterns for themselves" (4, p. 503).

Even if teacher innovativeness were widespread, it would present important problems. For one thing, such innovation would be difficult to control and evaluate. Another factor is that at the classroom level there is a lack of established, institutionalized procedures for disseminating what is gained from creative or innovative effort. Otherwise put, the further fruits of such creativity are usually lost. Still another problem of innovativeness at the classroom level is that pressures for conformity to established practices are severe. Informal

colleague expectations—and sometimes formal expectations—emphasize standardization and routine rather than novelty. "There are too many restraining forces—from himself in terms of fear and anxiety, from students, from colleagues, and from the administrative structure—for the teacher to be an appropriate unit of effort for change all by himself" (15, p. 24). Furthermore, "It is a unique school indeed in which teachers discuss their classroom problems, techniques, and progress with one another and with their principal. In most schools, teachers practice their own methods—rarely hearing, or even caring, if one of their colleagues is experimenting with some new teaching device or technique" (9, p. 269).

It is also a fact that the teacher is caught in the current conflict between norms of professionalization and norms of bureaucratization. The norms of professionalization are often at odds with the procedures and requirements of bureaucratic structures (See 1, pp. 46-49).

I have dwelled at some length upon the role of the classroom teacher in innovation, and will not be able to devote as much attention to other actors on the educational scene. The detailed discussion of the teacher makes it possible, however, to illustrate major facts that are also pertinent to an analysis of the roles of incumbents of other positions in education. For one thing, the teacher is <u>constrained</u> by the environment—both formal and informal—in which she works. This is generally true of other positions and their incumbents. Second,

existing role expectations both encourage and impede change, but in the main they militate against the teacher's serving as a source of innovation. Third, it is quite evident that there is a lack of institutionalized procedures through which the teacher can play an important role in the innovative process. Given the existing situation, it is unrealistic to expect basic changes to occur as a result of innovativeness by teachers.

(2) The Administrator.

Among the positions in this category I shall discuss specifically those of the principal and the superintendent. As in the case of the classroom teacher, the principal is faced with the general expectation that he will encourage innovation in his school. The principal is expected to be a curriculum expert and to spend a great deal of his time and effort in innovative activity in consultation with his staff. The problem here is, however, that he is burdened with such a multitude of managerial activities that it is extremely difficult for him to devote the time and effort required for innovation on a substantial scale. In those instances in which innovations do occur, the principal plays an important role as a link between the classroom teacher and the superintendent and his assistants. He is also significant because he has an important voice in allocating resources at the school building level.

The superintendent, on the other hand, is currently viewed by researchers as the key figure in the innovation process at the local level (See 5, pp. 10-11; 16, p. 411). Structural adaptations which

are necessary for change to be introduced effectively depend upon the decisions of the superintendent and his top assistants. More than any other person at the local level, the superintendent has the authority to make decisions with regard to the organization and allocation of resources and personnel. The opposite side of the coin is also evident—that is, if innovations do not occur at the local level, we can expect the superintendent to have played an important role in maintaining the status quo

It is likely that research findings concerning innovation, decision-making, and related activities will continue to build up impressive evidence concerning the power and influence of the superintendent. In research we have done in Oregon, the superintendent is by far the most powerful figure in education, actually as well as potentially, on the local community level (21, pp. 10-12).

(3) The School Board.

The power and influence of the school board member have been vastly exaggerated in the United States. His power and influence extend in many directions, of course, but they deal primarily with the allocation of resources. If we look at the literature, we find that school board members are generally considered to be effective brakes on innovation rather than stimulators of it. Furthermore, when they play the role of stimulator, they are viewed with suspicion because the suggestions which they make often conflict with professional judgment. In most communities the traditional role of the school board

member is confined to scrutinizing the managerial and financial aspects of educational operations and insuring that community values and interests are represented in the decision-making process (See 12, Ch. 2).

(4) The Lay Public.

The role of laymen in educational innovation is paradoxical. On the one hand, they often encourage local educators to adopt innovations that have received a great deal of publicity at the national level. It is likely, however, that public opinion exerts a braking force on innovation at least as frequently as it stimulates it. For instance, in educational conflicts a prominent theme deals with alleged departures from the traditional curriculum.

To my knowledge, all studies of participation in educational activities at the community level show that but a very small proportion of the population is actively engaged in educational affairs. In Oregon communities we have studied, the most influential people in the community are rarely represented in educational activities of any sort (23). The active laymen who do get involved in educational activities are usually those of middle class status who are "pro-education." They represent the highly educated, high income, managerial, and professional segments of the community (20, pp. 132-135).

(5) State Departments of Education.

While the role of the state department of education varies considerably from one state to the other, it is likely that its significance lies primarily in its ability to administer regulations and

set standards, provide financial support, and encourage the improvement of standards and quality of performance. Brickell tells us, however, that even in New York, where presumably the state education department is more influential than in most states, its role in innovation is very modest (4, pp. 506-507).

(6) Education Faculties in Colleges and Universities.

The role of the faculty member of the school or college of education gives primary importance to the training of new generations of teachers and administrators. Most of all, perhaps, this training emphasizes what is considered to be the best of current practice. The lack of sound research upon which practice can be based limits this role from the point of view of innovativeness, but it should never be forgotten that faculty members play a very significant role in socializing each generation of teachers. In this capacity they play the roles of translator, disseminator, trainer, and indoctrinator.

Education professors also contribute to in-service training programs for educators in the field. In this capacity, it might be anticipated that their role in encouraging innovation would be a significant one. Limited empirical evidence makes us wonder whether or not this is indeed the case. Brickell, for example, found in New York that "the colleges and universities have little influence on instructional innovation in elementary and secondary schools" (4, p. 507).

(7) Professional Associations.

Because these organizations operate on the national as well

as the state and local levels, they are able to bring together very large professional groups and to publish materials which reach an extremely large number audience. The question has been raised, however, as to how effective these organizations are in changing educational practices. One student of the subject has suggested that the main influence the associations have is an informal one—that is, friends and acquaintances get together at meetings and the individual is influenced by the opinions and judgments of those colleagues whose judgment he trusts. The same writer indicated that "most administrators and teachers believe that the full truth about programs in other schools is unavailable through professional articles, formal speeches at conventions, research reports, and other information sources which are far removed from the classroom" (4, p. 509).

(8) The United States Office of Education and Other Federal Government Agencies.

Traditionally, none of these federal agencies played a substantial role in the innovative process. During recent years, however, their roles have been transformed and are now becoming among the most influential of all. The USOE has assumed a vital role as a source of innovation. Its activities involve not only the provision of resources that permit innovation and experimentation to an extent hitherto unknown, but the Office is itself a source of ideas and practices. This role is currently increasing, owing to the excellence of the professional staff now employed in the USOE.

Other federal agencies, such as the National Science Foundation,

have had enormous influence upon the content of innovations in education during recent years. Many of the new programs in the natural sciences and mathematics developed under the sponsorship of the NSF.

(9) Textbook Publishers.

"The schools depend heavily on instructional materials and can scarcely operate without them. The single fact that commercial companies develop materials to command the widest possible market is a great decisive factor in shaping instructional innovations" (4, p. 511). On the other hand, innovations are sometimes not welcomed by those publishers who already have a substantial stake in a program which they have underwritten.

(10) Scientists, Technical Specialists, and Other Experts.

As noted above, the recent role of scientists and mathematicians in the innovation process has been extremely significant. In even more recent developments, some of the specialists in other academic fields are beginning to play similar roles in curriculum development. Furthermore, various engineers, psychologists, and others are applying computer technology to the field of education. While such roles are either recently developed or presently just emerging, they will in all probability have an important impact on innovations in the future.

In concluding this all-too-brief analysis of existing sources of innovations, I should like to make a few interpretive comments. First of all, I have tried to summarize what is known or believed about the roles of these individuals, groups, and agencies in the innovative

process. I have not, of course, expressed any judgment about what roles any of these should play as sources of innovation. In other words, I have tried to take stock of what is, not what should be. My second major point--and this is by far the most important one--is that if one looks over the statements made in this section, he cannot fail to be impressed by the fact that the greatest stimuli to changes in education originate in sources external to the field. What I have shown is that the sources of innovation lie largely outside the local community, and in most instances outside the educational profession. Innovations are channeled into the local community from the outside, and their introduction on the local community level depends primarily upon the superintendent. It is very difficult to find parallels to this remarkable situation in other professional fields.

CONDITIONS FOSTERING AND DISCOURAGING INNOVATION

There are several bodies of literature that deal with the conditions under which innovations are accepted and rejected. On the one hand, we can draw generalizations about change from studies of innovation and resistance to innovation on the societal level. Then there are studies of individuals as sources or creators of innovations. It is interesting to note that there has been a near fixation on studying individuals in the change process. This is certainly the case in studies of adoption and diffusion; it is also true for studies of creativity and leadership. The third body of literature--the most recent and smallest--deals with the organizational conditions that are related

to the introduction, acceptance, and rejection of change. Let me summarize a few generalizations from each of these bodies of literature.

Generalizations From The Study Of Change At The Societal Level

In the behavioral sciences, notably sociology and anthropology, scholars have dealt with the problem of change for a considerable period of time. Out of this work has come a number of generalizations about change and resistance to change. It is not presently known exactly how these generalizations pertain to smaller social systems. Interestingly, however, most of these generalizations are quite compatible with those found in the literature pertaining to individuals and organizations. Following is a list of generalizations drawn from a recent summary of findings (3, pp. 614-618):

(1) When social changes are introduced that are desired by the people involved, they can be assimilated with relatively little disruption; but undesired innovations, even small ones, are difficult to put into effect.

(2) Changes imposed upon a society from outside are very likely to be rejected; forced changes from external sources may result in overt compliance but covert resistance.

(3) When a social change threatens or appears to threaten the values of the people affected, the greater the resistance to change and the greater the social costs involved in introducing the change.

(4) Social changes are more likely to be accepted if they are introduced slowly through existing institutions, with the people affected

being involved in discussion of the changes and with much attention being given to persuasion.

(5) In heterogeneous societies change is accepted more rapidly and easily than in homogeneous ones.

(6) Change occurs most frequently, readily, and easily when it involves the material aspects of the culture, when it deals with aspects of the culture close to the society's "cultural focus," and when it deals with "the less basic, less emotionally charged, less sacred, more instrumental or technical aspects than in the opposite."

(7) Changes are more likely to occur in form rather than in substance.

(8) The leaders of major social changes are unlikely to come from those traditionally in control; rather, innovations originate most frequently among deviant, marginal, and disaffected groups.

Generalizations Concerning Change By Individuals

The characteristics of innovative individuals, those who serve as sources of change, are difficult if not impossible to separate from the characteristics of the societies or the organizational settings in which they find themselves. For discussions of innovative individuals, I shall rely on two kinds of literature: that which deals with the adoption of innovations, and that dealing with individual creativity. With regard to the characteristics of innovators (adopters), it is helpful to look at the work of Rogers. With regard to innovators, Rogers says that "research studies of farmers, school administrators,

industrial firms, and aborigines indicate that they are not always the most respected members of their social system" (25, p. 55). Rather, these individuals are "adventuresome," "starry-eyed," "experimenters," or "individuals with their heads in the clouds." They deal with ideas and activities that are avant-garde, hazardous, rash, or risky. They are usually able to understand complex technical ideas and products, and they are not disturbed by repeated failure. They are usually young, have high social status (including education, prestige, and income), rely on impersonal and cosmopolitan sources of information, exert opinion leadership, and are regarded by their peers as being deviant and unusual individuals (25, pp. 57-59).

A summary of findings dealing with creative individuals has recently been prepared by Steiner. The attributes of such persons are very similar to those identified by Rogers. In addition to characteristics that mark the creative individual as deviant, Steiner also lists such factors as the following: the creative individual has conceptual fluency, being able to produce a large number of ideas quickly; he has originality and generates unusual ideas; he is able to separate source from content in evaluating information; he is motivated by an interest in the problem he faces and follows the problem wherever it leads; he suspends judgment and avoids early commitment, spending considerable time in analysis and exploration; he is less authoritarian than most people, and has a relativistic view of life; he accepts his own impulses, and is playful and undisciplined in his explorations; he

exercises independence of judgment and is not prone to conformity; and, while he has a rich and even "bizarre" fantasy life, he has a superior reality orientation (26, pp. 16-18).

It follows that such a person is the antithesis of the so-called "organization man." It is obvious that such a person would have a great deal of difficulty in adjusting to the demands for conformity which are characteristic of many existing educational settings.

Generalizations Concerning Change In Organizations

Generally speaking, the literature emphasizes that innovative organizations are those that create conditions that allow innovative individuals to operate in a facilitating setting. The innovative organization not only tolerates its deviants and other forms of originality, but encourages and rewards them. Organizations may encourage or stifle originality; those that fail to establish institutionalized procedures for rewarding originality have a low rate of innovativeness.

Steiner has summarized the literature with regard to creative organizations. He finds that such organizations encourage "idea men;" have open channels of communication; encourage contact with outside sources; employ heterogeneous types of personnel; assign non-specialists as well as experts to problems; use an objective, fact-founded approach; encourage the evaluation of ideas on their merits, rather than according to the status of the persons originating them; make systematic efforts to select personnel and to reward them solely on the basis of merit; invest in basic research and are flexible with regard

to long-range planning; experiment with new ideas rather than pre-judging things on "rational" grounds—i.e., everything "gets a chance;" are more decentralized and diversified than less innovative organizations; have "administrative slack," permitting time and resources to be used to absorb errors; have a "risk-taking ethos," tolerating and expecting that chances will be taken; are not run as a "tight ship," but permit employees to have fun, to have freedom in choosing and pursuing problems, and to discuss ideas; are organizationally autonomous, and do not try to pattern their interests and activities on other organizations that serve as models; have "separate units or occasions for generating vs. evaluating ideas;" and separate creative from productive functions (26, pp. 16-18).

PREVAILING CONDITIONS IN EDUCATIONAL SETTINGS

Given the above generalizations, how conducive are existing educational settings to innovativeness? Ronald Lippitt (15, pp. 12-14) has analyzed some "special features of the problem of change in the educational establishment." In comparing educational settings with those in agriculture, medicine, industry, and public health, Lippitt suggests several ways in which change in education is somewhat different from and more complex than it is in these other fields.

(1) To a greater extent than in most other fields of endeavor, significant changes in educational practice imply and require changes in the attitudes, skills, and values of the practitioner in order for

change to be successfully adopted and adapted.

(2) In education, "a great proportion of the significant new inventions in our field remain quite invisible, undocumented, inaccessible for consideration by potential adopters." There is a high level of "inhibition to communicating." There is "a lack of articulateness about what has been invented and a lack of documentation." In contrast to such fields as medicine or engineering, in which we find a great search for new ideas and products as well as established procedures for discovering them, teachers are characterized by a resistance or an inhibition to adopting another teacher's inventions.

(3) The educator apparently feels that he is supposed to be his own inventor and will be looked down upon by his colleagues and superiors if he adopts or adapts practices from another source.

(4) "There is in education a significant lack of a professional network of communicators and agents of change." This situation is in contrast to those existing in the other fields in which Lippitt has conducted investigations.

(5) "Frequently colleague relations are felt as inhibitions to the trying out and adopting of new innovations." Teachers put pressure on one another not to act as "rate busters" with regard to innovation.

(6) Lippitt finds a lack of creative working relations between educational specialists and those in such related fields as psychology, social psychology, sociology, anthropology, economics, and political science.

(7) There is "a lack of clear feedback to reinforce the change efforts, to tell the educator whether his tryouts are being successful in directions that he had hoped for."

(8) There is a feeling, particularly among administrators and curriculum coordinators, that there will be "reactions against experimentation in the larger socialization community of parents, agencies, organizations, board of education."

To these comments and criticisms I would add others that I regard as at least as fundamental. Indeed, it is my opinion that the following conditions pose major impediments to the achievement of effective changes in education:

(1) There is serious confusion in the field of education concerning the sources of reliable and valid knowledge. In another paper in which I pointed out that there is no alternative to empirical research conducted according to the canons of scientific method (22, p. 71), I voiced the belief that the culture of American education is not oriented toward a systematic search for knowledge; nor does it view either theory or research as necessary bases for reliable and valid knowledge. Consequently, to use Carlson's phrase (6, p. 5), education has a "weak knowledge base." A vicious circle exists: "(a) Many educators do not conceive of the scientific method and research as being of primary significance to their work; (b) This state of mind creates an atmosphere in which low priority is given to the conduct or utilization of research; (c) Because of low evaluation and

neglect, research continues to be a dubious enterprise; and (d) Because condition (c) exists, condition (a) is perpetuated" (22, pp. 71-72).

(2) In view of the tremendous complexity, size, and scope of the educational enterprise in the United States, the division of labor that exists is rudimentary and wholly inadequate for the specialized roles that must be performed if we are to make the right kinds of innovations effectively. I shall return to this matter later.

(3) Training programs for students of education reflect points (1) and (2) above. Most training programs do not prepare students for a wide variety of specialized roles, but attempt to give them a conception of the field of education which minimizes specializations. A major consequence is that relatively few specialists are prepared, especially in research, development, and dissemination; thus the teacher or administrator may feel that he is as much of a specialist or expert on a given subject as anyone else.

(4) There is a lack of opportunity, resources, and settings for introducing innovations on an experimental basis and for evaluating them objectively through research.

(5) Persons who play different roles in education—teachers, administrators, and researchers, for example—do not have their work linked together by any institutionalized means or procedures. Thus each can—and often does—conduct his work in isolation from and ignorance of the knowledge and specialized competencies of the other.

(6) There are grave weaknesses of channels and procedures for dissemination. Unlike many academic disciplines, education cannot

rely almost exclusively on the printed media for disseminating information. As was indicated above, there is a great deal of suspicion of sources of knowledge which are not known personally to the practitioner.

(7) As Matthew Miles has indicated (17, p. 634), the professional culture in education contains certain ideological beliefs that "serve to block effective innovation by effectively insulating educational practitioners from reality. For example, beliefs that American schools are locally controlled, that the school teacher is an independent autonomous professional, and that teaching can never be effectively measured or specified in other than intuitive terms, all appear to serve the function of protective myths." Miles also indicates that "local innovative efforts are restricted by the fact that the teacher's role is actually that of a bureaucratic functionary who has little power to <u>initiate</u> system-wide change, but—because of the ideology concerning professionalism alluded to above—tends to <u>resist</u> innovative demands, like most professionals in bureaucratic organizations."

(8) How educational practices can be related accurately to the goals and ambitions of the public is a question that is shrouded in doubt and uncertainty. A paradox, in fact, exists: while most change in education is externally induced, educators have but limited and highly unreliable means of identifying the scope and intensity of public demands for educational programs. Research has demonstrated repeatedly that educators interact with but a small fraction of the total population of the community. They respond to the demands of

articulate and vocal minorities and to the impressions which they receive from local mass media of communication. How extensive or intensive the public demands are to which they are exposed remains unknown in nearly all communities. It is very likely that both administrators and teachers feel far more restricted by public opinion than they actually are.

FROM DISCOVERY TO INSTITUTIONALIZATION: IDEAS FOR TRANSLATING KNOWLEDGE INTO PRACTICE

So far in this discussion we have noted numerous factors that militate against change and inhibit potential "sources" of innovation. In a period when, for the first time in history, resources are becoming available for extensive innovative activity under sponsorship of the federal government and other agencies, it is appropriate that we make drastic revisions in our traditional approaches to planned educational change.

In the past we have not seen clearly the relationships among the various sources, agencies, and processes of innovation. Happily, we are beginning to gain insight into the problem of relating knowledge to educational practice. The professional staff of the USOE is giving a great deal of attention to these problems, and personnel in the Research and Development Centers are dealing with problems of change ranging from discovery to implementation and institutionalization. Furthermore, certain individuals in the field of education and the behavioral sciences have been doing excellent work during the past few

years on the processes of innovation. While it is not possible to review all of this work in the context of this paper, I should like to call your attention particularly to the writings of certain scholars.

In the field of education, the work of Egon Guba has been especially extensive and impressive. He has worked on the relationships between research and practice (14), on the processes involved in educational change (13), and, together with David Clark (10), on the identification and analysis of potential change roles in education. Richard Carlson (7) has analyzed needed strategies for research on the diffusion of innovations. Jack Culbertson (11) has proposed the creation of special organizational settings for stimulating and conducting programs of planned change. The sociologist, Everett Rogers (24), has developed a model for educational change that calls attention to the consequences of innovation and to the diffusion of ideas within and between schools. In the field of social psychology, Ronald Lippitt and his colleagues at the University of Michigan have done considerable work on the initiation and maintenance of innovations in educational settings (15, pp. 15-23). Matthew Miles, on the other hand, has given much effort to the identification of organizational climates that are productive of innovations (18, pp. 54-72).

In the remainder of this paper, I should like to present some of my own ideas on change processes. In so doing, I will be reacting to my experiences in the Center for the Advanced Study of Educational Administration at the University of Oregon, where we have been concerned

with the relationship of research to practice during the last 20 months.

In my opinion, we have tremendously oversimplified the processes, stages, and role behaviors that are necessary in order to bridge the gap between research and practice. Discussion has been largely limited to a few activities and processes—basic research, applied research, dissemination, training, and professional practice. It is a delusion to believe that these processes are simple, that they are closely tied to one another, or that they can be linked together in sequential fashion. The fact of the matter is that the findings of basic research are of vague relevance for applied research as things now stand, and the products of both of these kinds of research are but tenuously linked to the dissemination and training processes. The expectation—rather, the dream—that the dissemination of findings to what is hopefully a receptive audience of practitioners who will change their practices accordingly has also resulted in great disappointment. Even if basic research, applied research, training, and dissemination had been done effectively, the results would not have produced the desired changes in the existing situation. In my judgment, we need some revolutions in thinking and practice along the following lines:

(1) Fundamental changes are necessary in the culture of education. The new orientation must give priority to the institutionalization of innovative activities as a fundamental part of the entire educational system. A scientific, analytical attitude toward the solution of educational problems is an absolute necessity. We need to establish research as the basis for educational practice. Doing so, of course,

will be a long-term task. In the meantime, it is probable that significant innovations in education during the next few years will not rest to any substantial extent upon new basic research findings. Rather, they will result from efforts on the part of developmental researchers, translators, change agents, trainers, and disseminators to discover the best empirical evidence available in existing research and other sources, to analyze this evidence, to brainstorm about its relevance to education and its applicability to practice, to introduce changes and evaluate their impact upon educational processes through sophisticated research, and—when innovations that work well are found—to shout about them from the rooftops.

(2) In order to relate knowledge to practice effectively, we need to create and establish a substantial number of role specializations. The lack of new positions and roles for carrying out the complex tasks to be performed is one of the most serious impediments in our attempts to translate knowledge into practice. A comparable situation to that in education would occur if we tried to operate the American economic system today with the occupational classifications and specialties that existed in Europe during the sixteenth century. These roles must be systematically identified and interlocked with one another. Some of these new roles are modifications of existing ones; others must be created virtually from scratch. These new roles, of course, will serve as important sources of innovation. Let me discuss some of these new roles and the types of processes involved in carrying them out.

(a) The Discovery Process. The process of discovery involves several types or kinds of research. In lieu of existing classifications, I would categorize research as basic, managerial, and institutional. Basic research would deal with the discovery of new facts and principles on a wide range of subjects. It would be conducted by institutions of higher education, by research and development centers, by regional laboratories, and possibly other organizations. Managerial research, which I view as "action" research for the purpose of solving problems faced by educational agencies and institutions, would be conducted by the same agencies, plus state departments of education and local school districts. Institutional research--data collection and analysis, including "social bookkeeping"--should be conducted by many agencies ranging from the USOE to state departments of education and local school districts.

(b) The Translation Process. This process is a part of all others. It involves summarizing what is known about appropriate topics in all areas of education. It also involves attempts to relate knowledge to practice by setting forth hypothetical formulations, speculations, and deductions relevant to educational problems. This process can be performed at all levels from the national to the local.

(c) The Experimentation Process. Experimentation embodies developmental research on a limited scale, evaluation research, and various activities that I would term revision, translation, and adaptation. Developmental research consists of systematic, planned interventions to institute change in educational settings. Evaluation

research measures objectively and systematically the consequences of these interventions. Following evaluation, the interventions are discarded, revised, adapted, or otherwise adjusted. The experimentation process involves mutual efforts by numerous specialists and administrators and teachers at the local level. It is anticipated that much of this work will be conducted through the new regional laboratories now being established. It is noteworthy that this process brings together new specialists and practitioners, with the practitioners playing important roles in the experimentation process—not as specialists in experimental design or evaluation, but as partners in the experiments and evaluations conducted.

(d) The Diffusion Process. Dissemination is one of the basic aspects of the diffusion process. It involves demonstrations in various settings, the use of mass media of communication, and all sorts of meetings and conferences at various levels in which interpersonal interchanges can be conducted. The diffusion process also involves continuous translation and re-translation so that adoption and adaptation can be related to the local situation.

(e) The Institutionalization Process. This process involves the relatively permanent establishment and maintenance of worthwhile innovations. It consists of continuous evaluation, revision of innovations to fit given situations, and the integration of innovations into the total educational program. The process will occur at various levels, but mainly at the state and local ones.

(3) Training programs must be developed to prepare people for

the new specialized roles as well as traditional ones. New graduate programs of instruction must be developed to train specialists of the sort that I have discussed above.

(4) A great deal of effort will have to be given to the development of linkages or connections between and among specialists who play different roles. The establishment of innovations requires that the specialists work together in an organized and systematic fashion, with knowledge of and respect for the contributions each can make to the total process of innovation.

(5) In order to bring these fundamental changes about, we will have to reorganize the status system that exists in the field of education. We need to re-legitimize old statuses and to legitimate new ones. Above all, we must develop reward systems that are compatible with the functional importance of the roles that will be played. Currently, many invidious distinctions in terms of prestige and rewards exist in the profession. These must be modified, removed, or rearranged as is appropriate to the new world in which we will be living.

(6) Much of our success in innovative efforts in the future will depend upon the professionalization of all actors in the educational establishment. It is clear from the literature on organizations that foster innovativeness that colleague relationships must prevail in order for people to work cooperatively and effectively with one another. We must modify the bureaucratic mode of operation which is prevalent, and reconcile the conflicting demands of professionalization and bureaucratization. If we can do these things, we will encourage--not

merely tolerate--those persons who are our best sources of innovation.

No one will deny that I am calling for extensive--even revolutionary--transformations in the social organization and culture of American education. I am quite conscious of the problems and barriers we face in attempting to overcome the challenges that face us. In my judgment, however, we can effect fundamental improvements in existing situations if we rise to this challenge.

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